

We would like to thank the reviewer for the additional constructive comments. We are grateful for all the time invested by the reviewer over both review rounds, which has helped to improve our manuscript. Please find a point-to-point reply below, with the reviewer's text in black, and our response in red.

Line 110: "This enables to simulate trace gases..." -> "This enables the simulation of trace gases..."

Adapted

Line 114: Could a reference be provided for the force–restore model or its general methodology, unless this is a common technique. (I am not an experienced soil modeller).

We have added a reference to Noilhan and Planton (1989).

Line 552: change "Supplement" to "supplementary material" to match Line 256. Personally, I would just remove supplementary material/Supplement and just leave Sect. S1.8, the S is the differentiator with sections in the main manuscript.

Thanks for the suggestion. In the main text we now refer simply to e.g. Sect. S1.8, when referring to sections of our own supplementary material.

Line 572: I believe the correct reference form would be: (derived in Kooijmans et al., 2019) – perhaps a point for the Editor or typesetter.

We have now changed the full sentence as follows, to avoid having brackets directly after brackets:

"This also likely explains why the parameterisation used in Lai et al. (2024), derived in Kooijmans et al. (2019), performs remarkably well for Hyytiälä, given that it was derived using (sunlit) leaf-scale observations from this site."

References

Noilhan, J. and Planton, S.: A simple parameterization of land surface processes for meteorological models, *Monthly Weather Review*, 117, 536–549, [https://doi.org/10.1175/1520-0493\(1989\)117<0536:ASPOLS>2.0.CO;2](https://doi.org/10.1175/1520-0493(1989)117<0536:ASPOLS>2.0.CO;2), 1989.